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**Changing Health
Beliefs and Practices
in
Rural Tamil Nadu**

C. M. E. Matthews

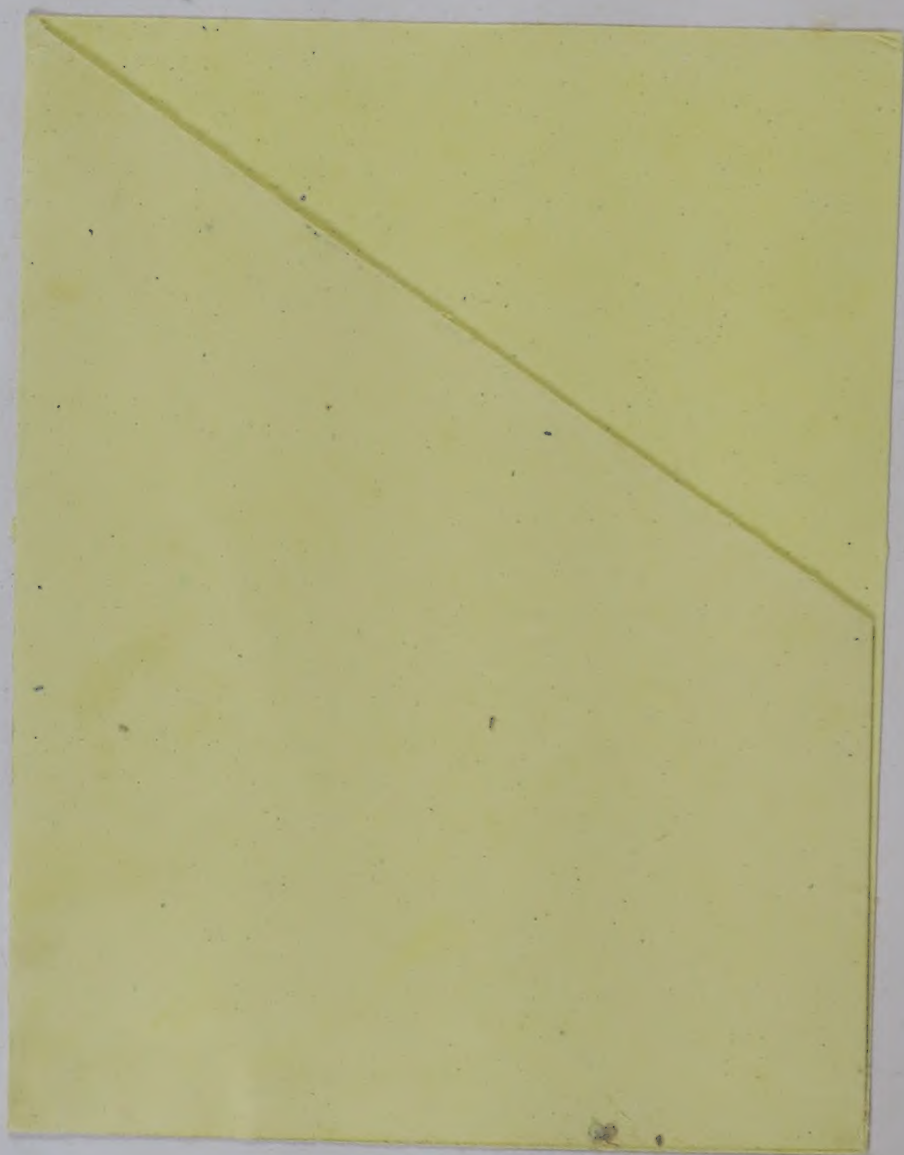
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CHANGING HEALTH BELIEFS AND PRACTICES
IN RURAL TAMIL NADU

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C.M.E. Matthews

V. Benjamin

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Introduction

In this book the results of two studies are described. The first study was carried out in two blocks, K V. Kuppam and Anaicut in North Arcot District, Tamil Nadu. The second study was in a part of Kanniambadu Block in the same district, and was carried out in order to evaluate the extension work of the Department of Community Health. In this second study the service area was compared with a control area. Government services are of course present throughout both service and control areas but it is assumed that these will be similar at least within each block. The first study consisted of a knowledge, attitude and practice (KAP) survey only; the second study also included a census and household survey, and weighing of all children under 5 years. These results have already been published in more detail elsewhere (Matthews and Benjamin 1979a, 1979b and 1980).

Health education programmes should be evaluated by assessing the change in behaviour obtained, as this is the final goal of such programmes. However it is often useful to evaluate also the intermediate stages, and to assess knowledge and attitude as well as practice. Such a study is also a useful preliminary stage before starting health education. An important principle of health education is 'start from where they are'. We cannot do this unless we know something about existing knowledge and attitudes. Communica-

tion is difficult if people do not share any common beliefs or knowledge. We cannot expect the patients to immediately assimilate our ideas, and so it is our responsibility to learn about their ideas so as to bridge the communication gap. The existence of this gap can easily be demonstrated by asking patients coming out of a rural health centre about what the doctor told them, what disease they have, what is the prognosis. Usually they will have practically no knowledge of these things. When we understand their beliefs about the causes of diseases, the symptoms and the treatment we can build on existing useful ideas rather than attempt to remove all their present beliefs. Also various kinds of traditional practitioners have much influence and cannot be ignored; their influence may be useful if their cooperation can be obtained.

Methods

Questionnaires

The design of the KAP questionnaire is based on a previous more detailed study in one village in K.V. Kuppam Block (Matthews 1975, 1979). In this study it was found that village people had their own names for diseases, which sometimes corresponded to a particular allopathic disease, or sometimes included several different allopathic diseases, or several names might be given to the same allopathic disease. In the present survey these names have been used to ask about these diseases. For example, villagers believe in about 6 different kinds of diarrhoea and if only one word is used for diarrhoea much information about their beliefs is lost.

Attitudes were measured by means of Likert scales for various health topics. The scale items were pretested and selected by the method of internal consistency (Likert 1967). The whole questionnaire was quite long and took about 1½ hours to administer.

Census

In areas *A*, *B* and *C* (second study) the census was taken for every household. Each member was listed with age, education and occupation, and births and deaths in the previous year were recorded. It is often difficult for people to remember births and deaths which occur more than one year ago, so respondents were only asked about these events in the previous 12 months. However as it was not possible to complete the census in all villages simultaneously, the period for recording of births and deaths is slightly different in each village. These periods extended from January 1975 to December 1976, except for one village, Sholavaram where the period was December 1973 to December 1974.

KAP sample and interviewers

In areas *D* and *E* no census was taken but households were listed, in order to obtain a systematic random sample for the KAP survey. Every tenth household was taken in areas *D* and *E* and every fifth household in areas *A*, *B* and *C*. Heads of households or their wives were interviewed in alternate households. The sections on antenatal care and delivery, weaning and diet of children under five years were asked only to women. Further details on methods used for the diet and weaning survey and weighing of children are given in Chapter 4. Male interviewers interviewed men and female interviewers women, with only a few exceptions. The interviewers for areas *A*, *B* and *C* were one female social worker and one male mathematics graduate. The interviewers for *D* and *E* included for men a social scientist, a health educator, and a sanitary inspector; for women a nutritionist and a social worker. Every attempt was made to obtain an interview with the sample person, but there were some refusals, some had moved out since the households were listed and a few were never available or had died. The total number of samples and per cent completed for all the areas was as follows:

| <i>Area</i> | <i>No. sampled</i> | <i>% completed</i> |
|-------------|--------------------|--------------------|
| A | 289 | 76 |
| B | 169 | 84 |
| C | 284 | 77 |
| D | 1528 | 95 |
| E | 1580 | 90 |

C.M.C. Services in different areas

The different areas covered in these studies include the following

| <i>Area</i> | <i>Block</i> | <i>Population</i> | <i>CMC Services*</i> |
|-------------|------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------|
| A | Kanniambadi (part of 4 <i>panchayats</i>) | 7,560 | Rural Hospital within 5 miles, Leprosy SET units PHN visits MCH clinics Leprosy clinics Family planning |
| B | Kanniambadi (3 villages) | 4,370 | |
| C | Kanniambadi (5 <i>panchayats</i> and 3 villages) | 7,260 | |
| D | Anaicut (whole block except for small inaccessible hill area) | 84,000 | Family planning only |
| E | K.V. Kuppam (whole block) | 90,000 | Weekly mobile clinic (2 stops) up to 1973 |
| | | | PHN visits and Rural Hospital for 10,000 population |

*PHN = Public Health Nurse; MCH = Maternal and Child Health;
SET = Survey, Education and Treatment.

In addition to government services throughout, in K.V. Kuppam Block there is a leprosy service, SET units, run by the Schieffelin Leprosy Research and Training Sanatorium, Karigiri, since 1963.

Area A includes those villages where service has been given for a number of years. In area B services had only been given for a comparatively short time when the survey

was carried out. In area C, the control area, there were no CMC services except for family planning. The family planning services consisted mainly of home visits by two field workers, with occasional film shows. Leaders' meetings were held occasionally for various topics. In one *panchayat* of area A, a special nutrition project was carried out (Matthews, Benjamin, Samikkannu, Punithavithy and Palocaren 1977) and in area A plus one *panchayat* in area C, a leprosy health education project (Matthews, Jesudasan, Selvapandian and Benjamin 1980) was carried out; however the latter was after almost all the surveys had been finished so does not affect these results. Village handicrafts were also started in area A, but again the effect of this came mainly after the present surveys. A health insurance scheme was started in Edayanchat in area A in 1975, and about 30 families joined.

In addition medical students visited most of the villages under the Family Health Advisory Service; each of two students was responsible for the health care and health promotion of two families. Also occasionally medical and nursing students, and interns posted in the Rural Hospital carried out special projects in the villages, such as immunisation for example.

Diseases

In this chapter results are given for diseases, their symptoms, causes, prevention and treatment and also for sanitation.

Results for areas *A*, *B* and *C* for disease and sanitation were similar to those in areas *D* and *E* for most questions and there were only very few statistically significant differences. Therefore to simplify the tables, only results for *D* and *E* are given except where results in area *A* differ significantly from area *C* or from areas *D* and *E*. Differences between areas *C*, *D* or *E* are not relevant for present purposes, and may be due either to differences in geographical area, or to differences in government services.

Birth and death rates, mean income and assets were calculated for each area, and are given elsewhere (Matthews and Benjamin 1979). There is very little difference in the statistics for the three areas (except for weights, see Chapter 4). Birth rate and percentage of preschool children are both slightly higher in the control area, but this is not statistically significant.

The economic status is difficult to calculate accurately. The estimated mean income per family per year was found for the whole population from the census data, and for the KAP sample population from the KAP data. The mean per capita income for different villages did not vary much. However this may not be correct; it was assumed that all

coolie workers get 210 days work per year, whereas in fact this will vary in different villages, according to the total amount of land owned by landowners in that village. A correction could be made for this, but in some adjoining villages coolies also work on land belonging to the next village, so this correction would be difficult to make. People do not readily remember how many days coolie work they get each month and there does not seem to be any simple way of getting over this difficulty. In a previous paper a more intensive study of family economy was made (Matthews 1979), but this takes much time and could not easily be done over a wider area. Assets are lower in the service than in the control area (difference highly significant, $p < .001$). Assets are considerably higher in area *D* (Anaicut Block) than in other areas at least for the KAP sample respondents, and this difference is highly significant ($p < .001$).

In some villages birth rates were obtained for several successive years and these can be examined to investigate the trend in birth rate. This is only possible in the larger villages, otherwise number of births is very small. Except for Pennathur village there tends to be a downward trend in the birth rate from 1973 or 1974 to 1976.

Classification of diseases

As already mentioned villagers have their own names for diseases which do not correspond exactly with allopathic diseases. Where there is no exact one to one allopathic equivalent, the Tamil name or an English translation of the Tamil name for the disease has been used. Twenty diseases were included in the questionnaires, either because they are of importance for community health or because they are of great importance to the village people. A brief summary of the explanation of these diseases follows. More details are given below and elsewhere (Matthews 1979).

| | |
|---------|--------------------------------------------------------------------------------------------|
| Fever | The same as allopathic. |
| Typhoid | The same as allopathic. |
| Cholera | The same as allopathic. It is occasionally thought to be a visitation of goddess Mariamma. |

| | |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measles | The same as allopathic. It is thought to be a visitation of goddess Mariamma. |
| Diarrhoeas | |
| <i>Bedhi</i> | Diarrhoea, thought to be due to heat. |
| <i>Mandhai</i> | Diarrhoea in babies and small children thought to be due to lactating mother eating certain forbidden foods, which harm the baby through the mother's milk. |
| <i>Dhosham</i> | Diarrhoea with dehydration and sometimes vomiting in small children. It is thought to be due to the lactating mother seeing a woman who had an abortion recently, or seeing a dead dog or cat. Some evil influence gets into the child through the mother's milk. |
| Dysentery | Same as allopathic. |
| Worms | Only visible worms will be known. |
| <i>Sevappu</i> | Disease occurring in new born babies who become cyanosed and often die. The allopathic equivalent of this disease has been investigated and includes various conditions including cyanosis due to venous stasis arising from mechanical and anoxic birth injuries, peripheral circulatory collapse, hypothermia or haemorrhages (Jadhav and Matthews 1976). |
| <i>Janni</i> | This includes several different diseases with different symptoms and causes according to the village people. One of these occurs in women after delivery and may be post partum psychosis; it is thought to be due to cold. Another disease occurs in men and is thought to be caused by sexual intercourse with a menstruating woman. |
| <i>Isivujanni</i> | This is the nearest term for tetanus, but may be taken to mean fits due to other causes. |
| Whooping cough | Same as allopathic. It is believed that it will last for three months. The people believe in various traditional methods of treatment and prevention. |
| Scabies | Same as allopathic. |
| No blood | This is the nearest term found for marasmus, but may also be taken to mean anaemia. |
| <i>Udhukamalai</i> | Kwashiorkor, or anaemia with oedema, is thought to be related to <i>manjal kamalai</i> , which is jaundice. |
| Mouth sore | This includes angular stomatitis and other mouth sores. |
| Tuberculosis | Same as allopathic. The name may be used for other respiratory diseases also. |
| Leprosy | The name is only applied to lepromatous leprosy. The patch is not connected with leprosy and is attributed to themal (tinea versicolor) or a bite. |
| Smallpox | Same as allopathic. Only prevention was asked about, as all believe it is caused by visitation of goddess Mariamma. |

Some of these disease categories are also discussed by Djurfeldt and Lindberg (1976), who studied one village in Chingleput District, Tamil Nadu. Their *karappu* is clearly the same as *sevappu* (also called *karunsevappu* or *karunnoi* (Matthews 1979). However they equate it with tetanus only.

The results are shown in Tables 1-5, for these 20 diseases. Not all questions were asked for all diseases; for example prevention was not asked about where there is no allopathic prevention; symptoms were asked about mainly where one village name includes several allopathic diseases, or one allopathic disease is thought by villagers to be several different diseases. In Tables 1-5 those responses which are given by only a relatively small per cent of respondents have been omitted. In general the results are similar in the two blocks, but there are a few differences which will be mentioned.

Symptoms

In Table 1 (p. 44), the symptoms mentioned for various ambiguous diseases are shown. The different symptoms may correspond to different sub-divisions of the disease, e.g. for *janni*, or for 'no blood' which can mean marasmus or anaemia. For leprosy only 8 to 11 per cent mention the patch and most give the symptoms of lepromatous leprosy; as already discussed, only this is 'leprosy' to most villagers. *Udhukamalai* (kwashiorkor) is sometimes confused with jaundice (*manjal kamalai*) to which it is believed to be related.

Results for areas *A*, *B* and *C* were similar to those for *D* and *E*.

Causes

The causes are similar to those found in the previous study (Matthews 1979) where they are given in more detail. Measles, smallpox and sometimes cholera and whooping cough are believed to be *ammai*, which means that they are supposed to be due to a visitation of the goddess Mariamma or one of her six sister goddesses. There are also many

other *ammais* for some of which the allopathic equivalent is not known (Matthews 1979). Somewhat fewer respondents mentioned the goddess in K.V. Kuppam Block than in Anaicut Block. For *dhosham*, *mandhrams* will be chanted. These are prayers in Sanskrit believed to have magical powers to cure disease. Also a *thayittu* a string with a piece of rolled up metal with a *mandhram* written on it, may be tied round the neck.

For both *dhosham* and *mandhai* there is a harmful effect on the baby due to something in the mother's milk. There are believed to be about six different kinds of diarrhoea: another kind is *kudallettram* mentioned as a cause of *bedhi* (the ordinary Tamil word for diarrhoea). *Kudallettram* is thought to be caused by the intestines getting displaced upwards or twisted due to lying in a hollow place, or due to a fall. Another kind of diarrhoea is believed to be due to indigestion. 'Heat' is also a possible cause of diarrhoea. The idea of 'heat' comes from the Tridosha theory and requires some explanation.

The Tridosha theory is the basis of much of the Ayurvedic system and other Indian systems of medicine (Kutumbiah 1969). According to this theory there are three elements in the body which must be kept in balance—heat, cold and air. Certain foods produce heat in the body, others produce cold and others air. This is nothing to do with hot temperature, or hot spicy foods, but is the supposed effect on the body. If too much of one kind of food is eaten, e.g. 'hot' food, this produces an imbalance of heat, and this leads to certain diseases. Cold foods should be eaten to restore the balance. This theory is discussed more thoroughly elsewhere (Matthews 1979), and is described in detail by Kutumbiah (1969). Diseases which were mentioned in this study as due to heat include measles (subsidiary cause), diarrhoea, dysentery, whooping cough (by a few respondents only), scabies and mouth sore. Diseases said to be due to cold include fever, typhoid, *janni* and *isivujanni*.

Some diseases are attributed to dirty surroundings or lack of hygiene, e.g. cholera and scabies. It is also believed that if purgatives are not given regularly that dirt accumulates in the 'stomach' and causes disease (the stomach,

intestines and other internal organs are not distinguished). For example, worm infestation is said by some to be due to not taking purgative.

Eating certain things that should not be eaten is another cause of disease, e.g. eating uncooked rice or earth, for worms or *udhu kamalai*, or eating ash for *udhu kamalai*. Eating sweet things is also thought by some to cause mouth sore or worms.

Sevappu is cyanosis or blueness of the extremities in the new born and is a much feared disease. In the previous study a traditional practitioner and others said it was due to a kind of heat caused by too much sexual intercourse for the mother during pregnancy. In this study people have mentioned the pregnant mother eating forbidden food, or hereditary cause, or infection. The exact allopathic equivalent of *sevappu* is being investigated, it includes a number of different conditions (Jadhav and Matthews 1976).

The symptoms which correspond to the different forms of *janni* are not quite clear and some symptoms may be common to several forms. *Isivujanni* is not known by many and may be confused with other kinds of *janni*.

Malnutrition diseases are not usually recognised as such. The two meanings of 'no blood' (*raththam illadha*) as marasmus or anaemia have already been mentioned; many do not know about it at all. *Udhukamalai* (kwashiorkor, or anaemia with oedema) has also been discussed already; it is not attributed to lack of any food.

For tuberculosis and leprosy most people do not know the cause; some say infection or hereditary for both the diseases. For leprosy some also attribute it to excessive sexual intercourse, and in other studies (Matthews, Jesudasan, Selvapandian and Benjamin 1980; Selvapandian, Richard and Wilson 1972; Selvapandian 1975) this was the most frequently mentioned cause. It is thought that leprosy is a later stage of venereal disease.

For causes of diseases, results in areas *A*, *B* and *C* were similar to those for areas *D* and *E*. The only significant difference was that scabies was attributed more often to lack of a daily bath in area *A* ($p < .01$).

Prevention

For prevention there is some improvement of knowledge in the service area. More respondents mentioned immunisation as a method of preventing typhoid, measles, whooping cough and *isivujanni* (tetanus). This difference was highly significant for typhoid and whooping cough ($p < .001$), significant for measles ($p < .01$) and probably significant for *isivujanni* ($p < .05$). For measles it is unlikely that many have actually heard about the vaccine which was only used in two villages; they may be thinking of smallpox vaccination (*ammai*). Also in the control area more people mentioned taking good food to prevent *raththam illadha*, the nearest term for marasmus (difference probably significant $p < .05$). For tuberculosis more mentioned injection for prevention in the service area, and also more said nutritious food for prevention in this area (both differences not significant). A larger number in the service area knew about immunisation (highly significant $p < .001$) and understood that it prevents the disease before it comes (probably significant $p < .05$). (Table 4.) More knew immunisation for whooping cough, fever (both highly significant, $p < .001$), tetanus (significant $p < .01$) and tuberculosis (not significant) in the service area (Table 4). Also a larger number had had their children immunised (difference highly significant $p < .001$), mainly for smallpox and whooping cough (Table 4).

Reported occurrence and treatment

Table 5 shows the per cent of respondents who said they had had the disease in their family. For nearly all diseases more respondents said they had had the disease in areas *D* and *E* than in areas *A*, *B*, *C*. (This may be only related to the way the question was asked, e.g., more time given for remembering, and is probably not a real difference.) For whooping cough and *raththam illadha* (marasmus), there is a lower reported incidence in the service area, but this difference is not significant.

The treatment most commonly taken (or what would be taken if they had the disease) was classified as 'allopathic' 'traditional', 'spiritual', or 'home' treatment. 'Traditional' treatment include treatment by Ayurvedic, Siddha or Unani practitioners. Another kind of traditional practitioner is the *chembadavar*, and per cent taking his treatment is included in the traditional treatment. *Chembadavars* are specialists in children's diseases and may give Siddha or Ayurvedic medicine as well as chanting *mandhrams*. *Mandhrams* are prayers in Sanskrit, the chanting of which is believed to have magical power to cure disease. 'Spiritual treatment' means treatment by *mandhrakarars*, who only chant *mandhrams* and do not give any medicine.

For fever, typhoid, cholera, *janni*, *isivujanni*, tuberculosis, leprosy and 'no blood', allopathic treatment is preferred by the majority of respondents, although for 'no blood' the per cent is lower as many do not know. For *bedhi* (one kind of diarrhoea), dysentery, scabies and worms, a larger per cent of respondents take traditional or home treatment, although about half will take allopathic treatment. For *mandhai* (another kind of diarrhoea) *sevappu*, *udhukamalai*, and cough, mainly traditional treatment is taken, including treatment from *chembadavars* for *udhukamalai* and whooping cough; these four are all diseases of children. For *dhosham*, also a children's disease, the treatment is mainly 'spiritual' or by *chembadavar*; in both cases involving chanting of *mandhrams*. Mouth sore is mainly treated at home, or by traditional treatment and measles is either treated at home or no treatment is given. Homeopathic treatment is not very important for these diseases, fever is mentioned most often for homeopathic treatment. The per cent of respondents who do not know what treatment they would take is usually small, but is largest for 'no blood' and for *sevappu*, tuberculosis, leprosy and *isivujanni*.

It seems that allopathic treatment is not taken for diseases which are believed to have a supernatural cause or for which there is no clear allopathic equivalent to the traditional concept of the disease. *Janni* is an exception to this as the allopathic equivalent is not clear, nevertheless allopathic treatment is taken. It seems also that most of the diseases

which are common causes of death in small children are treated mainly by non-allopathic methods.

There is a slight tendency for more respondents to prefer allopathic treatment in the service area *A* than in the control area. The greatest differences are whooping cough, and *udhukamalai* (kwashiorkor or anaemia with oedema) and also *acharam* (angular stomatitis or mouth sore), leprosy and *bedhi* (diarrhoea). These differences are highly significant, ($p < .001$). The difference is also significant for scabies ($p < .01$). However, when all 5 areas are considered together it seems that for leprosy, *bedhi* and mouth sore that it is area *C* which is low for allopathic, rather than area *A* which is high.

Curability

When asked whether the disease can be cured, the per cent who said 'yes' was 54 to 72 per cent in the different areas for *raththam illadha* (marasmus or anaemia), 63 to 81 per cent for *udhukamalai* (kwashiorkor or anaemia with oedema), 81-91 per cent for mouth sore (including angular stomatitis), 26-65 per cent for tuberculosis and 16-38 per cent for leprosy. For the first three of these diseases, the malnutrition diseases, most of the remaining respondents did not know whether the disease could be cured, and for tuberculosis and leprosy some said it could not be cured and some did not know. For tuberculosis a higher per cent in area *D*, Anaicut Block (50.6 per cent) than in area *E*, K.V. Kuppam Block (26.2 per cent) believed that it can be cured, and in the service areas *A* (60.0 per cent) and *B* (64.5 per cent) also the percentage is higher. For *raththam illadha*, *udhukamalai* and leprosy also the per cent who believe it can be cured is higher in area *A*. Thus there is some tendency for more respondents in the service area to believe that diseases can be cured and the difference is highly significant for *udhukamalai*, significant for tuberculosis, and probably significant for the rest.

With regard to the time required for cure most respondents said less than one month for *raththam illadha*, 1 week

to 3 months for *udhukamalai* 1 day to 2 weeks for mouth sore, less than 3 months to 5 years for tuberculosis, and less than 1 year to 5 years for leprosy. Of those who said leprosy can be cured, about one fifth to one third said less than one year. Thus the time required to cure malnutrition diseases is somewhat underestimated, but for tuberculosis and leprosy the underestimation is much greater.

Communication with the doctor

When asked what they ask before leaving the doctor, some ask when to come again, how and when to take medicine, and what food to take. Nineteen to 26 per cent won't ask anything. Only 4 to 14 per cent ask when the disease will be cured, and only 2 per cent ask what disease they have. Only 0.2 per cent in Anaicut Block and 7 per cent in K. V. Kuppam Block ask what is the cause of the disease.

When asked what the doctor tells them, some say that he asks them to come again after two or three days, or to come again if not feeling well. Some say he gives directions about food. This probably derives from traditional practitioners who usually prescribe a restricted diet. A few say he prescribes the medicine or says that the disease will be cured soon. Only 0.2 per cent in Anaicut Block and 2 per cent in K. V. Kuppam Block say that he describes what the disease is.

There is clearly very little communication between doctor and patient about the nature of the disease. This was also discussed in the earlier study (Matthews 1979) where it was suggested that this lack of communication was an important barrier towards effective use of the health services. The visit is often ineffective because patients do not know how to use the services. Patients' expectations are not met and they become disillusioned and change to traditional practitioners. The doctor is often not interested to explain the disease in simple and relevant terms to the patient, and the patient is often afraid to ask in case the doctor might get angry, or simply has become conditioned not to expect any explanation. Effect of social and cultural gap between

doctor and patient is also discussed by Mahadevan Pillai and Dutt (1976).

Available services

Respondents were asked where people in their village go when ill and what diseases are treated by each practitioner or centre mentioned. Answers could be classified into the following types of services.

ALLOPATHIC

- Hospital
- Primary Health Centre (PHC)
- Other health centres (e.g. CMC Health Centre)
- Panchayat* Union dispensaries
- Mobile units
- Private MBBS doctors
- Maternity assistants/ ANMs, PHC sub-centres or
Maternal and Child Health (MCH) centres
- Leprosy SET units (e.g. SLRTS Karigiri programme)
- Tuberculosis sanatorium

HOMEOPATHIC

- Private practitioners

TRADITIONAL

- Ayurvedic, Siddha or Unani practitioners
- Chembadavars* (children's specialists)
- Bone setters
- Untrained *dais*

SPIRITUAL

- Mandhrakarars*
- Muslim mosques

These are similar to the types found in the previous study. Different types of traditional and spiritual practitioners are also described by Djurfeldt and Lindberg (1976).

Allopathic Many different hospitals were referred to, some quite far away probably by people who had moved from another place (e.g. Bangalore). All the main hospitals in Vellore and nearby were mentioned. Most frequently mentioned were Government Hospital in Vellore, and CMC* Hospital. The primary health centre for each block was mentioned

*CMC = Christian Medical Collage

frequently and also PHCs for nearby Blocks were mentioned, as well as the *panchayat* union dispensaries in each Block. The CMC Rural Health Centre at Kavanur was also mentioned (very frequently in K.V. Kuppam Block) and the former mobile service from CMC which operated in Anaicut Block. In K.V. Kuppam Block, one such doctor who comes daily from Vellore was frequently mentioned. A few LIM and LMP doctors were also mentioned, and some who were not identified may also be LIM. The maternity assistants at most of the sub-centres and MCH centres were also mentioned a few times.

Homeopathic. A number of different homeopathic doctors were mentioned. Nearly all are within the Block, but a few are in Vellore.

Traditional. A number of Ayurvedic, Siddha or Unani practitioners were mentioned mostly within the Block. These cannot be distinguished from each other as the people do not know the difference, and only by interviewing them can it be ascertained. A few of them were interviewed in the previous study or have been interviewed since. Most of them use medicines from several different systems.

Some of the well known *chembadavars* in Vellore and Gudiyatham were mentioned. These are very important and influential. Also a few bone setters, including the well known ones at Nagariputhur in Andhra Pradesh were mentioned.

A very large number of untrained *dais* were mentioned since there are usually at least two or three in every village.

Spiritual. A few muslim mosques were mentioned, one in Vellore, one in Gudiyatham and others in the Block.

Mandhrakarars, like untrained *dais* are present in nearly every village, and so a large number were mentioned. They treat mostly *dhosham*, and bites, by chanting *mandhrams* (prayers in Sanskrit), and may also give a special string to tie round the neck, sometimes with a *mandhram* written on a piece of metal (*thayittu*).

Use of services

All these types of practitioners have been described in detail in the previous study. Their influence is very strong and they might be positively used if they could be educated. In some cases their methods would need only slight modifications. They are potentially useful for health education. They could also be taught when it is important to refer the patient to a hospital; they do this in any case if they think they cannot cure the patient. The *mandhrakarars* (men) and the *dais* (women) are in largest numbers but may be the most difficult to educate and change. Both are strongly traditional and often quite old. The Ayurvedic/Siddha/Unani practitioners may sometimes be more cooperative, but there is much individual variation. *Chembadavars* are potentially the most influential, particularly for the vulnerable preschool children. However they are usually already so successful and prosperous that it may be difficult to motivate them to change.

The practices of the *mandhrakarars* are harmless and need not be prevented except in so far as they delay more effective treatment in urgent cases (e.g. snake bite).

Since practically all traditional practitioners are only important for certain specific diseases it would only be necessary to educate them about these particular diseases.

Environmental sanitation

Hygiene. Ninety-six to 94 per cent of respondents know that food should be covered in order to keep it clean and free from germs. The only other measure suggested is to eat the food when hot (9-11 per cent of respondents). For drinking water 90 to 86 per cent also say to cover it, but 12-10 per cent say to boil it, 7-5 per cent to filter it and 4 to 5 per cent to add medicine to the well. To keep the body clean almost all answer in terms of a bath, 60 to 84 per cent say daily bath. For the surroundings 93 to 98 per cent say to clean every day; 18 per cent in area *D* also say to mop the floor every day.

Latrine. More than one-third say that a latrine is necessary. Various reasons are given, convenience and privacy are mentioned most (10-14 per cent), a few say it is good for sanitation or avoids spreading diseases, or to lead a healthy life (8 per cent). Reasons for not having one include 'we use the fields' (11-24 per cent), bad smell (12-32 per cent), dirty near the house (2-10 per cent) or not necessary (8-13 per cent). Only 5.2 per cent in Anaicut Block and 2.7 per cent in K.V. Kuppam Block actually have a latrine, mostly in the larger villages. Most of these are used by the whole family but some are used by women only. Nearly all are said to be always used.

Sixty-four per cent in the service area *A* said it is necessary to have a latrine compared with 47 per cent in the control area and this difference was highly significant ($p < .001$). More people in the service area give the reasons that it is good for sanitation (19 per cent in area *A*, 10 per cent in area *C* (significant $p < .01$), and also more say that it avoids spreading diseases (not significant).

Environment. Surprisingly nearly half of the respondents in areas *D* and *E* know that if there are pools of water near the house, mosquitoes will breed and cause diseases, and in the service area *A*, 80 per cent knew about it (difference highly significant, $p < .001$). Most would prevent it by filling the place with earth, or draining the water away. Only 0.7 per cent in Anaicut Block mentioned soakage pit.

To get rid of rubbish most would dispose of it in their fields, in a distant place, or in a compost pit. The reason most commonly given is to obtain good manure, but to have clean surroundings is also mentioned.

Attitudes (Table 6). Unfortunately it was found that the different interviewers introduced their own bias in the attitude scores. Since for different *panchayats*, different proportions of samples were done by different interviewers, it is not possible to compare results in different *panchayats* in areas *D* and *E*. For total results in each Block, the different topics can be compared because there will be the same distribution of interviewers for each topic. Even here there will be some

error as bias varied with topic, but on the whole the different biases should balance each other out. For areas *A*, *B* and *C* the same two interviewers interviewed all men and women throughout so that different *panchayats* can be compared with each other.

Attitude score can vary from - 100 per cent to +100 per cent. Results are shown in Table 6. Scores for PHC, allopathic medicine and immunisation are positive in all areas but for latrines are negative in all except service area *A*. Area *E*, K.V. Kuppam Block, has more positive attitudes than other 'non service' areas (except for latrine) and attitudes for some topics approach those in service area *A*. This may be because there is actually some CMC service in a part of the Block or it may be due to differences in the effectiveness of the government services in different Blocks.

For leprosy the score is only more positive in area *E*, K.V. Kuppam Block and is negative or slightly positive in all other areas. The difference is highly significant, [$p < .001$.] This difference is probably due to the presence of the SET Units under the SLRT Sanatorium, Karigiri. However in spite of this more positive attitude there is no significant difference in knowledge in this Block (see above).

Attitudes are more positive in the service area *A* than in the control area for all topics, but especially for antenatal care and immunisation. These differences are highly significant ($p < .001$) for allopathic medicine, immunisation and antenatal care; significant ($p < .01$) for tuberculosis and probably significant ($p < .05$) for primary health centre, latrine and family planning, and not significant for leprosy.

The difference in attitude scores for different parts of area *A* are shown in the original publication (Matthews and Benjamin 1979). The most positive attitudes are in Edayanchat and Thuthipet *panchayats* (differences all highly significant, $p < .001$). Edayanchat is close to the Rural Hospital and the Christian Medical College and has had service for a long time. (Pennathur has also had service for about the same time but is further away, and also has a less stable leadership structure.) Thuthipet is the area where the special nutrition project was carried out (Matthews *et al* 1977); this will be discussed in Chapter 4.

Implications for health education

Village people have their own beliefs about causes of diseases and treatment, and for certain diseases these beliefs are quite different from the allopathic system of medicine. Their system includes diseases which only partially overlap with allopathic diseases; their concept of a disease may include several allopathic diseases or a single allopathic disease may be sub-divided into several different diseases. The situation is not so much 'ignorance' as a different set of beliefs. However with regard to prevention there is very little knowledge of any kind.

For most diseases allopathic treatment is preferred, but for certain diseases, mostly where there is no clear allopathic equivalent, traditional treatment is preferred. For diseases believed to be caused by goddesses, spiritual treatment or no treatment is given. Traditional treatment is particularly important for children's diseases, including some of those which lead to most deaths in pre-school children. Reasons for preference for traditional treatment have been discussed in a previous publication (Matthews 1979). This question is also discussed by Marriott (1965), Carstairs (1955), Hasan (1967), Ishvaran (1968), and Djurfeldt and Lindberg (1976). The cultural and social gap between allopathic doctor and patient is one of the most important factors.

Because of this cultural and social gap, there is practically no communication between doctor and patient about the cause and nature of the disease. For better utilisation of services, this situation needs to be improved. Doctors should encourage patients to ask questions about their diseases, and should be able to provide simple explanations in terms which are relevant to the patients. This will only be possible if the doctors themselves know something about the patients' beliefs. If the doctors feel that they do not have time to do this, it should be the designated function of some other health worker. There are not enough trained health educators available to do this, but it could also be done by other categories of workers who are given some training and who are interested in trying to establish effective communication with the patient. In fact it may be an advantage if it is done by

someone who is not highly trained but is more from the same background as the patient as this will help communication. Even if such a person may occasionally make mistakes the result will probably be more effective than the present system of complete lack of communication. Possible use of traditional practitioners should also be considered although there may be some difficulties involved.

Even after many years of services in area *A*, the differences in knowledge, attitude and practice are rather small. A few individuals seem to have been educated, but for most topics, there is not very much change for the community as a whole. In fact in most of the health education given, an individual approach was adopted, except for certain special projects, such as that for nutrition. However in the leprosy health education project (Matthews, Jesudasan, Selvapandian and Benjamin 1980), which was carried out after the survey reported here, there was a considerable improvement in knowledge and attitude. In this project (as in the nutrition project) behavioural science principles were followed and group methods and leaders' training (Jesudasan and Matthews 1979) were used to educate the whole community, not just individuals.

The results presented here indicate how hard it is to change people's established customs and beliefs. Even after years of contact with allopathic medical services, the community still believes in the traditional causes of diseases and traditional treatment for certain diseases. This may be partly due to a lack of communication between doctor and patient, since the doctor is not sufficiently aware of the patients' beliefs and attitudes; this has already been discussed above and elsewhere (Matthews 1979; 1975).

Nevertheless some improvement is seen. The greatest effect seems to be on knowledge, attitude and practice of immunisation. Immunisation requires less effort on the part of the people than many other changes (e.g. feeding of preschool children), and does not usually contradict any traditional beliefs.

Some differences were found between all three areas in Kanniambadi Block (*A* and *B*) and the other two Blocks (*D* and *E*). Occasionally this may be due to interviewer

differences, or it may be due to local variations as these areas are separated geographically. Or it is possible that in some cases changes brought about in the service areas spread to the nearby control area also

Input in terms of numbers of staff and time and money spent has been fairly high, but output is not very impressive. One difficulty is combining service with teaching. For example the health insurance scheme was not successful in the rural area because it ran at a large deficit. In the urban area however, it became self-sufficient. The difference is probably due to the fact that in the urban area all patients were seen by one senior doctor, whereas in the rural area they were seen mainly by interns, who, due to lack of experience often prescribed unnecessarily expensive drugs. Also nurses could cover only a smaller area because of the demands of teaching. A more suitable teaching method has yet to be worked out, where the students become an asset to the service programme rather than a liability

Negative results are often suppressed or at least not published. The present results while not entirely negative are not as positive as had been hoped. Nevertheless it seems worth publishing them as something which can be compared with the results of others, and with results in the same department in future. In fact thorough systematic evaluation is seldom attempted in community health work, and such data have not been published for other projects, so no comparison can be made. If the present work challenges others to make the attempt to evaluate their work it may be worth while. Subjective impressions of the value of projects and programmes are not adequate. Only if we really evaluate the effect on the community, and attempt to find out what will produce the greatest effect, will we be able to improve our methods and give the practice of community health a sound scientific basis. As already mentioned (see also Chapter 4), it has been shown that application of behavioural science principles can be used to obtain better results.

Summary and conclusions

Village people have their own beliefs about the causes and treatment of diseases, which are similar to those found in an earlier more detailed study in one village. For most diseases allopathic treatment is preferred, and attitudes to allopathic medicine and the primary health centre are mostly positive. But for certain diseases traditional or spiritual methods are preferred and these are mostly those diseases for which there is no clear allopathic equivalent to the traditional concept, or which are believed to be caused by goddesses or spirits. These diseases include many of those which the villagers believe to be the cause of death in small children.

In order to reduce infant and preschool mortality it may be important to study the villagers beliefs about these diseases and find their allopathic equivalents, so that effective health education may lead to change in treatment sought. A variety of traditional practitioners and spiritual healers are available to the villagers. Local healers include *dais* (untrained midwives) and *mandhrakarars* (who chant prayers). Villagers are aware of and visit well known traditional practitioners in Vellore and other places, even though this involves travelling some distance.

The influence of these practitioners might be used to advantage, if they can be suitably educated and involved in health programmes. Since it is these people often who treat the child who is seriously ill, it is important to influence them and improve their methods.

Although attitudes to allopathic medicine are positive, there seems to be little communication between doctor and patient and particularly no discussion of cause and nature of the disease. This can probably only be improved if doctors take some interest in the beliefs of the patients. Knowledge of preventive measures is particularly low, and for this much education is required. Nevertheless, attitudes towards immunisation are positive. There is some knowledge of environmental sanitation and hygiene but it is not always applied. Suggestions for successful health education may include the following.

1. More understanding of the village people's beliefs about health and disease by every member of the health team.
2. More explanation to patients of the cause and nature of the disease in simple, relevant terms.
3. Use of traditional practitioners, through educating them and involving them in health programmes.
4. More knowledge about preventive measures should be given by using mass media, since even initial awareness is lacking. This can be followed up with small group meetings of leaders and others.
5. Use of learning experiences as far as possible, (see Chapter 4). Other suggestions have been given in a previous publication (Matthews 1975).

Family Planning and Antenatal Care

For family planning and antenatal care the methods used and areas covered were the same as those described in Chapter 1. Questions on antenatal care were asked only to women respondents.

Although there have been many KAP studies in the field of family planning, it seems that few of them actually measure knowledge, rather than merely awareness, and also few use a properly constructed attitude scale. There are not many questions which really probe the respondents' understanding of the different methods, and most family planning workers seem to concentrate on persuading people to accept, rather than helping them to make a real choice based on understanding of the different possibilities. For most educational programmes the cognitive factors are emphasised most to the exclusion of motivational and action factors, but for family planning the reverse seems to be true. The cognitive ambiguity leads to the spread of many false rumours and gives rise to much fear in the general public.

Family Planning

With regard to preferred family size, in Anaicut Block (area D) about half prefer three children or less and half

four or more, whereas in K.V. Kuppam Block (area *E*) more than half prefer three or less. Areas *A* and *B* were similar to area *D*, and area *C* between areas *D* and *E*.

For spacing, most prefer three years or more, generally for health of child and or mother. For temporary methods the most popular is 'self-control', and many do not know. Only a very few mention family planning methods. In area *A* fewer mention self-control (difference significant $p < .01$) and more mention loop (difference not significant). For permanent methods 60-71 per cent mention sterilisation, although some again say self-control.

When asked 'what is family planning?' most say that it prevents child birth or limits the number of children. About half know about sterilisation. When asked the different methods very few can give a satisfactory explanation and most do not know.

Vasectomy. About 33 per cent in area *D* and 47 per cent in area *E* described it as 'cutting the nerve', and a few others said 'operation for men'. About half did not know.

Tubectomy. Twenty-six per cent in area *D* and 41 per cent in area *E* described it as 'twisting the uterus', or 'turning it upside down'. Again about half did not know.

Loop. Ninety-three per cent in area *D* and 87 per cent in area *E* did not know about it. A few said it was used by women.

Condom. Eighty-nine per cent in area *D* and 83 per cent in area *E* did not know about it. A few thought it was used by men, or that it was a rubber tube or sheath.

Contraceptive pill. Ninety-one per cent in both areas did not know about it. A few thought it was for abortion.

Safe period. Only 9 per cent in area *D* and 8 per cent in area *E* knew of such a period. Even of those who knew, only a negligible number knew the correct time. Many think that it is 10-15 days after menstruation which may in

fact overlap with the most probably time for conception.

Results in area *A*, *B* and *C* were similar for knowledge of methods except that a few more in area *A* knew about the existence of the safe period (difference significant $p < .01$). However they did not have any better knowledge of the correct time.

When asked whether each method was good or bad more said bad than good for most methods. For vasectomy about 20 per cent said it was good and about 60 per cent said it was bad. For tubectomy respondents were a little more favourable, about 33 per cent said it was good and about 45 per cent said it was bad; the small number who knew what the loop is, were about equally divided in considering it good or bad. Only condom and contraceptive pill were considered good more often than bad by the few respondents who knew about these methods. Reasons given for considering methods bad were usually bad effect on health or on ability to work hard, or that some die. Reasons for considering methods good were that they prevent childbirth, or that there are no complications.

The respondents were also asked about the opinions of husbands/wives and of the elders in the family. In areas *C*, *D* and *E* more of these relatives think that it is bad than think it is good, however in the service areas *A* and *B* the reverse is true. This difference between area *A* and *C* is highly significant, ($p < .001$).

Reported use of methods is given in Table 7. Only 8.5 per cent in area *D* and 10.6 per cent in area *E* admit to having used any method. The per cent reporting use is higher in area *A*, i.e. 20 per cent and the difference between areas *A* and *C* is probably significant ($p < .05$). The actual acceptance for areas *A*, *B* and *C* is also given in Table 7 and agrees well with reported acceptance. When the few who say they have used any method are asked about the advantages and disadvantages of the methods, replies are similar to those given to the previous question about this.

Only 7.1 per cent in area *D* and 7.0 per cent in area *E* say they will use any method in future. Only 22 per cent in area *D* and 26 per cent in area *E* would like to know more about the methods.

Antenatal care

The average number of pregnancies per woman was 4.8 to 4.9 and live births 4.5 to 4.6. The average number of still births was 72 to 85 per 1000 women, and abortions 250 to 160 per 1000 women. The number of children who died was 1.26-1.21 per woman, and children alive 3.26-3.41 per woman. Many of the deaths were thought to be caused by fever, *dhosham*, *sevappu*, diarrhoea, *ammai* (goddess) or evil spirit (Table 8). It is interesting that, except for fever, these are just the diseases for which allopathic treatment is least sought (Chapter 2). One might conclude that babies die because allopathic treatment is not sought because of the beliefs, but it may equally be true that allopathic treatment has proved ineffective for such diseases *in their experience* and hence they resort to traditional methods. The reasons for the treatment not being effective have already been discussed, and probably the main reason is lack of communication.

Eighty-two to 86 per cent of the children who died were under 5 years, and 52-54 per cent were under 1 year. More women in the service area *A* attribute their child's death to *ammai* (chickenpox, measles, smallpox etc.), and this difference is highly significant ($p < .001$). The reason for this is not clear.

Only 9-10 per cent delivered at home. Only 15-17 per cent were attended by doctor or nurse and the rest by untrained mid-wife or relative. In the service area *A* more have had deliveries in hospital, primary health centre or subcentre, but this difference is not significant.

Less than one fifth said that they see a doctor, nurse or mid-wife when pregnant, slightly more in area *E*, K.V. Kuppam Block do so. In the service area considerably more do so and the difference is highly significant ($p < .001$). Only a few mentioned having any of the possible complications of pregnancy. Most do not eat anything extra or avoid any food during pregnancy. In area *A* fewer avoid particular foods (difference significant $p < .05$). Most did not think that inadequate food during pregnancy would affect the baby in areas *D* and *E*, but in areas *A* and *B* most said that it

would do so (difference between area *A* and *C* highly significant, $p < .001$). It seems that much education is needed about antenatal care.

Attitudes

Results are shown in Table 9. Attitudes towards both family planning and antenatal care are negative in areas *D* and *E*, and more negative in area *D* than in area *E* (difference highly significant $p < .001$). They are positive in area *C* and considerably more positive in area *A*. The positive difference between areas *A* and *C* is highly significant ($p < .001$) for antenatal care, and probably significant ($p < .05$) for family planning. The difference between area *A* and areas *D* or *E* are highly significant ($p < .001$) for both antenatal care and family planning. The attitudes in different parts of area *A* are given in the original publication (Matthews and Benjamin 1979). For family planning Edayanchat has a highly significantly more positive attitude ($p < .001$). For antenatal care there is no significant difference.

Significance of social economic and cultural factors

Many people still seem to want more than three children but most appreciate the value of spacing. Paradoxically there is hardly any knowledge of permanent methods. However for permanent methods there is much misunderstanding about the nature of the operation. There is much fear of effects on health and ability to work. Elders tend to be more against family planning than heads of households or their wives. Attitudes to family planning are negative. Acceptance of family planning is better in the service area, and attitudes more positive, but there is not much difference in knowledge. More real understanding of the methods might help to reduce wrong ideas and rumours which lead to fear of the methods. The higher acceptance in area *A* may be due to effect of admissions in Rural Health Centre for delivery. (In a previous study it was found that hospitals had a

significant effect on acceptance [Matthews 1979].)

Only very few have antenatal care and attitudes towards it are negative. Most do not eat anything extra during pregnancy, and do not feel that lack of food at this time will harm the baby. However a considerable improvement in attitude, some improvement in knowledge, and some improvement in reported practice in seeking antenatal care was found. Antenatal care is given much emphasis by the nurses, and since maternal and child health clinics are held in the villages, it does not require a very great effort to participate.

It is not possible here to review the extensive literature on family planning knowledge, attitudes, and practice. Only a few particularly relevant papers will be mentioned and some studies carried out in the same area. However it may be noted that even in 1968, many of the conclusions mentioned in this paper had already been reached and are set out in an extensive review of family planning studies (Gopal Rao 1968). Gopal Rao mentions the lack of specific knowledge, the need to use group methods and to work through leaders, and the need to give more emphasis to spacing and temporary methods. However 10 years later it seems that most of these needs have still not been met.

An unpublished family planning study in Kanniambadi Block (Benjamin *et al*) indicated also that there was little real understanding of the methods, of which most people are only just aware. Similar results were found in an intensive study in one village in K.V. Kuppam Block (Matthews, 1979). Other reasons for lack of acceptance of family planning methods have been discussed in the previous publication (Matthews 1975). The fear that children will not survive is also an important factor (Wyon and Gordon 1971; Chandrasekar 1972). Economic and social factors are also of great importance. It has been shown that considerable differences in fertility patterns for different castes may occur (Mahadevan Pillai and Namboothiri 1972). Strong and stable caste norms exist. Highest castes may adopt family planning to prevent subdivision of lands, but also for lower castes who have little property and whose only source of income is their labour a large family often seems more

advantageous (Matthews 1975). Only as income increases, the cost of having an extra child is perceived to rise, since only then people want more 'high quality' children—e.g. more educated, and better fed and clothed—(Leibenstein 1957). Only when 'utility' of a child falls and perceived cost rises will such people be motivated to have fewer children. Therefore a family planning project might be more successful if combined with a project for economic development.

Djurfeldt and Lindberg (1972) find an increasing number of births per wife for increasing amount of land owned in one village in Chingleput District. This conflicts with the findings of Mahadevan Pillai and Namboothiri (1972) in a much larger sample. The differences cannot be resolved even by taking account of the considerable difference in caste and income distribution in the two studies. Djurfeldt and Lindberg's implication that population control is not necessary because total number of live births is about 6 to 7 and living children 4 to 5 per woman seems to disregard the growth rate consequent to such fertility. In spite of their own conclusion in an earlier chapter that poverty is the most important factor in malnutrition, they maintain that even landless labourers are normally able to provide adequately for their children. The argument that agricultural production can be increased twofold, and land might be more evenly distributed, does not take account of the exponential nature of population increase.

Several studies have demonstrated what is sometimes called the 'KAP gap'; that is, the fact that many of those with positive attitudes, do not actually adopt any method (Mahadevan Pillai 1975; Park, Chung, and Han 1975; Kar 1968). This may be due to barriers to action, e.g. wife cannot adopt because husband is against it, or fear of supposed effects on health may act as a barrier. It may also be due to the time required to take a decision; Mahadevan Pillai (1975) found that this time is longer for women. Park, Chung, and Han (1975) using multiple classification analysis make a detailed analysis of different factors affecting the different stages of the adoption process, using a modification of Lionberger's five stage model. The decision, choice making, and adoption stages are influenced mainly by inter-

personal communication (i.e. talking with neighbours, exposure to rumours, and number of practising persons known), amount of discussion between husband and wife, and credibility of services. The earlier stages are also influenced by mass methods such as printed materials and public meetings, as in Lionberger's model. Knowledge only accounts for about 20 per cent of the total variance.

Many social psychological studies have shown the importance of group influence in changing attitudes and behaviour. Individual methods of health education are usually less effective because the individual is often not able to withstand the pressure to conform with the traditions and customs of his society. Group methods are more likely to change the community as a whole particularly if influential leaders are involved (Oswal 1973). The effectiveness of these methods has been demonstrated (Ranganathan, Srinivasan and Matthews 1965; Bhende, Jahina, Mohanty, 1966). In a previous study (Matthews 1979, 1975), it was found that the pattern of acceptance of family planning indicated that small groups of family and neighbours as well as leaders were influential in persuading others to accept.

The influence of hospital staff through deliveries in hospital has already been mentioned. This was found to be greatest for high caste women who could more easily afford hospital deliveries. In an unpublished study (Benjamin, Matthews, Nair and Palocaren), it was also found that people, especially women, heard of the methods mainly through hospitals, although friends and neighbours also played a part. The importance of the post partum period has been well recognised in the setting up of post partum units.

Summary

Although in general, knowledge attitude and practice of antenatal care seems poor, it can be considerably increased by means of education and services. For family planning, knowledge lags behind attitude and even acceptance, and much education is needed to avoid false rumours and fears. In giving such education, group methods should be used.

and temporary methods should be more stressed than at present. If family planning programmes can be closely linked with economic development programmes, results may be more successful. Deliveries in hospital should be encouraged for the sake of their educational effect.

Diet and Weaning

The methods used and areas covered are the same as described in Chapter 1. Questions on diet and weaning were asked only to women respondents.

In addition to the KAP survey, weights of children under five years were taken in all the villages of areas *A*, *B* and *C*. A spring balance with hanging cradle was used. Weights were compared with the 50th percentile of the Harvard standard weight for age. Since it has been shown that well fed Indian children grow to the same weight for age as American children, the American standard is used (Datta Banik, Nayar, Krishna and Raj 1972). This is a more absolute standard than that obtained from actual groups of Indian children, which will contain varying proportions of less well fed children according to the distribution of economic status in that particular group. The extent of malnutrition was expressed as the per cent of children with weight below 60 per cent of Harvard 50th percentile. This is one definition of marasmus (Lancet 1970).

For estimating quantities of food given to children, mothers were shown a series of bowls of different sizes and asked to point to the one which corresponded with the amount of the particular food given.

Diet and weaning habits are probably harder to change than most other practices because the change involves considerable sustained effort, especially if the family is poor.

Food is an extremely important topic for villagers, especially as they often do not have enough and beliefs about food are strongly held. This is discussed in more detail elsewhere (Matthews 1979 and 1975).

Knowledge

The number of calories given per day and the amount of different foods which respondents think should be given are shown in Table 10. However for a one year child it is considerably better in area *D*, which may be better off economically. The actual amount given may be even lower, as the questionnaire method, even using the bowls, is likely to over-estimate the amount given for poor families. This is discussed in a previous study (Matthews 1979). There is no significant difference for calories given in the service area as a whole. The amount respondent thinks should be given is lower than the recommended amount for protein foods, greens and jaggery (crude brown sugar containing iron). In most cases the actual amount given will be lower still. For jaggery there is one group of respondents in area *E* (K.V. Kuppam Block) who give more than others, these are mostly landowners who make their own jaggery; much sugar cane is grown in this block. In general less of these foods are given in areas *A*, *B* and *C* than in areas *D* and *E*. In areas *A*, *B* and *C* there is less wet land, and mainly dry crops are grown. The only difference between service area *A* and control area *C* is that more greens are given in area *A*, and this difference is highly significant ($p < .001$). The correct reasons for giving different foods such as milk, dal, groundnuts, greens, jaggery are not known by most respondents who give reasons such as for taste or flavour or good for health, or to eat with rice/*kali*. Jaggery is believed to cause cough, mouth sore and too much heat. The only difference in the service area *A* is that more respondents say that groundnuts are good for health (highly significant, $p < .001$).

Age at which solid food is first given varies from 6 to 36 months with just a few who say they only give after this; 68 to 87 per cent give only after one year. In service area *A*

more give solid food at 6-11 months than in control area *C* (difference significant, $p < .01$). However it is area *C* which is lower than other areas, not *A* which is higher. Weaning foods given are mostly *kali*, *kulu*, *iddli*, and rice. (*Kali* and *kulu* are made from ragi, a millet, and rice; *iddli* is made from rice and gram.) Most respondents give several or all of these foods.

There is only a little knowledge of what foods should be given to prevent different kinds of common malnutrition i.e. anaemia, night blindness, kwashiorkor, marasmus, angular stomatitis. In the earlier study also it was found that people usually do not have the idea that lack of certain foods can lead to illness. Most do not know the answers to these questions and only a small per cent answer correctly. Apple is mentioned by some although it has almost no nutritive value. However in the service area *A*, a much higher per cent know that greens are good for the blood (difference significant $p < .01$) and also that greens are good for the eyes (difference highly significant, $p < .001$). Also more mention *kali* and *kulu* (ragi preparation) as good for preventing marasmus in the service area *A* (difference significant $p < .01$).

For diarrhoea and measles, cold (i.e. cold producing) foods are given (see above) such as curd or buttermilk. For diarrhoea, since some of these are liquid, e.g. gruel, buttermilk, milk, they will be beneficial in helping to maintain fluid balance. People may be advised to give these particular fluids as this may be easily accepted. However calories are likely to be inadequate since some say *kali*, *kulu* or rice should be avoided. Fewer avoid rice with *sambar* with measles in area *A* but difference is not significant. For measles *kulu* should be given, and *kali* avoided, for diarrhoea both *kali* and *kulu* are avoided. Fewer avoid *kali* and *kulu* in area *D*, probably because this area is better off and less *kali* and *kulu* will be eaten. Other cold foods should also be given for measles. More would give milk for diarrhoea in areas *A*, *B*, and *C*; this may be related to availability.

Attitudes

Results are shown in Tables 11 and 12. Of all the atti-

tudes measured those towards correct diet and weaning are most negative. As already mentioned this is probably one of the hardest things to change. In the service area as a whole the attitude is less negative than in the control area (Table 11), and this difference is highly significant ($p < .001$). However details given in Table 8 reveal that this effect occurs only in two of the service *panchayats*, Edayanchat and Thuthipet. Edayanchat has more positive attitudes for all topics and this is probably related to the fact that it is very close to the Rural Hospital, and that many CMC staff live there. It is also one of the two *panchayats* where the service has been carried on for longest (the other one is Pennathur which shows only a slight improvement in attitudes). Thuthipet is the *panchayat* where a special nutrition project was carried out, and it can be seen that this has had a considerable effect, even though service in this *panchayat* has been given for a much shorter time than Edayanchat or Pennathur.

Weights

The per cent of preschool children whose weights are less than 60 per cent of the Harvard 50th percentile was 7.1 per cent in area A, 7.0 per cent in area B and 11.8 per cent in area C. However the smaller number of such marasmic children in the service area cannot necessarily be attributed to the services. During 1975 when the weights were taken, there was a severe drought in the villages which considerably affected the economy and nutrition of the villagers. The effect could be seen in one village where a special nutrition project was being carried out, and where weights were taken monthly (Matthews, Benjamin, Samikkannu, Punithavithy and Palocaren, 1977). Unfortunately weights were taken in most of the service villages before the worst effects of the drought and in the control villages at about the worst period. Therefore it is possible that this is the reason for the difference in per cent of children with weight below 60 per cent of the standard.

Discussion

The special nutrition project results (Matthews *et al* 1977) show that behaviour with regard to diet and weaning can be changed in a comparatively short time, applying behavioural science principles and using community education rather than merely individual teaching. The 'common sense' method of giving talks to mothers in their homes, even when carried on for many years is found to be much less effective. The better results in Edayanchat are probably due to more experience in the Rural Hospital which is close by, and to the group influence of CMC staff living in the village—although the knowledge, attitudes and practice of the latter has not actually been compared with that of other Edayanchat villagers. It would be interesting to do this, and also to investigate further why there is such a large difference in effect on attitudes between Edayanchat and Pennathur.

In the special nutrition project, education was carried out in three stages, information, motivation, and action. There was emphasis on group methods including training of leaders, and on provision of learning experience for the mothers through nutrition rehabilitation. When a mother in the health centre actually sees her child improving with more food which she herself has cooked and fed to the child, she realises the importance of changing the child's diet at home and increasing the amount given. This is much more effective than any number of talks, and such a mother who has been convinced will then influence other mothers when she goes back to her village.

One of the most important changes required is to reduce the age at which solid food is first given, and this was achieved in the special nutrition project. Another is to give larger quantities of food to preschool children and this was also achieved.

On the other hand the present results indicate that only slight changes were obtained by the home visit method. Quite a large change in attitude was seen, but this was mainly in one village only (apart from the special nutrition project area). Not many nutrition education studies give a systematic evaluation of the effect on knowledge and

attitudes, which can be compared with the present results. The Project Poshak study (Gopaldas, Kansra, Srinivasan, Varadarajan, Shingwekar, Seth, Mathur and Bhargava 1975), does include some measurement of 'awareness' and 'attitude' both of these being mainly based on knowledge questions. With a very considerable input, including take home food supplements, nutrition rehabilitation, medical services, mass media, role playing and weight cards, a significant improvement in knowledge was obtained in the 'intensive phase'. This improvement was similar to that obtained in our special nutrition project (Matthews *et al* 1977).

In a previous study (Matthews 1979, 1975) it was found that poverty is one of the most important factors in malnutrition, and also that the actual diet of the people is in many respects not far from the best they can do in their circumstances (e.g. optimum calories per rupee spent). A very similar analysis has also been made by Djurfeldt and Lindberg (1976), who come to the same conclusion. Thus nutrition education programmes should include or be combined with economic development. This was attempted in our special nutrition project, but the effect in the time available for the project was very small. Nevertheless some improvement in feeding practices was obtained, indicating that if well motivated even the poorest will manage some change in their child's diet. Also certain changes such as earlier introduction of solid food for babies, and greater use of greens for example, do not involve much expense.

It may be questioned whether it is worth while to publish the present rather negative results. However it is valuable to compare these with the more positive results obtained in the special nutrition project and to see the greatest effectiveness of the application of behavioural science principles. Also it may be useful to stimulate others to carry out such evaluation of their own work for comparison.

Conclusion

Nutrition education given mainly through home visits produced only a small effect on knowledge and attitudes,

except in one village close to the rural hospital. On the other hand, education given according to behavioural science principles gave much better results. Effect of education on children's weights could not be properly assessed because of the effect of a severe drought.

Conclusion

In order to change people's health beliefs and practices it is necessary to first understand where they start from. Hence KAP studies are important, in spite of their limitations, not only as a baseline for evaluation but also as a basis for health education. The results of the present study are similar to those found in the previous more intensive study in one village, and indicate that the results are valid over a wider area. These beliefs of the villagers are quite complex and are part of a system and not just isolated superstitions. The important influence of these beliefs on infant and child mortality has already been discussed. More communication between health staff and patients is an important requirement.

It has been shown that application of behavioural science principles gives better results than use of 'common sense' methods. Health education should include information and action stages, with appropriate methods being used at each stage. In the early stages mass media are important, later group methods and personal influence of leaders and others are more effective. Finally, use of good follow-up to ensure satisfaction at the trial stage is most important. If professional health educators, trained in behavioural sciences, were used more often in health programmes, there might be a considerable improvement. A useful study to demonstrate the value of such staff would be to take two areas with the same inputs except that one had a professional health educator and the other had another kind of health

worker not trained in the behavioural sciences, and compare results in the two areas. At present there are only a few trained health educators available and since opportunities for them are limited, the number being trained does not increase. The vicious circle needs to be broken by providing more posts for health educators and increasing the number trained each year. Other health professionals particularly doctors, who usually take the position of leadership in a health team, need a better understanding of the functions and abilities of professional health educators.

If community health in general and health education in particular is to have a sound scientific basis, more evaluation of projects is required. Only then can different approaches be properly assessed and compared. Such evaluation should be based on the effect on the whole community, i.e. on variables such as per cent of eligible couples who adopt family planning, or per cent of children under five years immunised, or weight distribution for all children under five years. It is not adequate to give measures such as number of patients seen or number of sterilisations done. For final evaluation such behavioural measures are essential. However for intermediate evaluation it may also be useful to have measures of knowledge and attitudes; this information may give more insight into how to change behaviour. For example, attitudes to immunisation are positive and it is not too difficult to get parents to bring their children for immunisation. On the other hand, attitudes to correct weaning practices are very negative, and to change this practice requires a much more comprehensive and sustained health education programme. In this last case the action stage is particularly important because of the considerable barrier to action due to poverty.

Finally projects should be integrated and include not only promotive, preventive and curative health measures, including health education, but also methods to improve people's economic status. The latter can include employment schemes, handicrafts, agricultural improvements, animal husbandry, etc. The interaction between poverty and ignorance has already been discussed and these two factors have to be tackled simultaneously for the project to be effective.

Table 1
Symptoms

| <i>Disease</i> | <i>Symptoms</i> | <i>Per cent mentioned Symptoms</i> | |
|---------------------------------|---------------------------------|------------------------------------|------|
| | | D* | E* |
| <i>Janni</i> ¹ | Body chilled, cold or shivering | 26.2 | 33.1 |
| | Unconsciousness | 19.6 | 23.4 |
| | Becomes mad | 13.8 | 6.6 |
| | Fever | 8.1 | 8.1 |
| | Don't know | 27.5 | 41.2 |
| <i>Isivujanni</i> ² | Fits | 47.4 | 39.3 |
| | Breathing difficulty | 6.5 | 0.2 |
| | Cannot move arm or leg | 0.1 | 5.3 |
| | Don't know | 43.4 | 53.0 |
| No blood ³ | Weak or thin body | 45.6 | 45.5 |
| | Pale body, face, eyes | 31.0 | 16.7 |
| | Can't work | 12.5 | 20.8 |
| | Don't know | 35.3 | 37.4 |
| <i>Udhukamalai</i> ⁴ | Swelling of arms, legs, face | 75.0 | 71.3 |
| | Yellow body, eyes | 17.0 | 7.2 |
| | Pale body, eyes, bloodlessness | 21.0 | 12.9 |
| | Don't know | 19.4 | 22.4 |
| Tuberculosis | Thin body | 45.6 | 29.9 |
| | Cough | 26.1 | 33.5 |
| | Weakness | 21.1 | 10.5 |
| | Don't know | 31.0 | 30.0 |
| Leprosy | Crippled hands and feet | 53.0 | 27.5 |
| | Shrinking of fingers | 19.8 | 26.2 |
| | Ulcers and wounds | 10.7 | 3.8 |
| | Cracks in palms and feet | 1.1 | 19.3 |
| | Swelling of body | 10.2 | 5.7 |
| | Patches | 8.0 | 11.4 |
| | Ugly face | 7.3 | 4.1 |
| | Don't know | 22.4 | 31.1 |

D* = Anaicut Block; E* = K.V. Kuppam Block

1. Includes several distinct diseases. See Table 2 for causes.

2. Nearest term for tetanus.

3. Nearest term for marasmus. May also mean anaemia.

4. Nearest term for kwashiorkor. May also mean anaemia with oedema.

Table 2
Cause

| <i>Disease</i> | <i>Cause</i> | <i>Per cent mentioned Cause</i> | |
|---------------------------|-----------------------------------------------------|---------------------------------|------|
| | | D | E |
| Fever | Cold, wet | 52.2 | 39.5 |
| | Change of season or of water | 14.9 | 9.4 |
| | Cold food | 9.5 | 6.2 |
| | Hard work and tiredness | 12.7 | 8.5 |
| | Don't know | 18.9 | 35.7 |
| Typhoid | Cold, head cold | 5.2 | 4.3 |
| | Mosquitoes | 3.1 | 2.4 |
| | Infectious disease | 3.2 | 1.1 |
| | Dirty condition | 2.5 | 1.6 |
| | Germs | 1.2 | 2.4 |
| | Don't know | 74.5 | 86.0 |
| Cholera | Dirty surroundings | 23.2 | 22.9 |
| | Goddess Mariamma | 13.1 | 5.1 |
| | Bad food | 7.4 | 3.2 |
| | Poochi | 3.9 | 3.5 |
| | Don't know | 44.0 | 54.8 |
| Measles | Ammal (Goddess) | 50.2 | 30.0 |
| | Infection | 5.9 | 3.0 |
| | Heat | 5.8 | 3.4 |
| | Don't know | 35.8 | 62.2 |
| Diarrhoea <i>Bedhi</i> | Bad food | 29.2 | 20.3 |
| | Indigestion | 22.0 | 31.6 |
| | Eating forbidden food | 12.9 | 8.5 |
| | Excessive eating | 7.9 | 7.4 |
| | Heat | 7.5 | 6.8 |
| | Kudallettram | 7.3 | 3.9 |
| | Don't know | 15.0 | 21.8 |
| <i>Mandhai</i> | Mother of breast-feeding baby eating forbidden food | 60.0 | 51.6 |
| | Eating groundnuts | 8.2 | 1.0 |
| | Eating bad food | 5.8 | 9.6 |
| | Don't know | 23.5 | 32.6 |
| <i>Dhosham</i> | Mother of breast-feeding baby seeing aborted women | 56.0 | 62.5 |
| | Mother of breast-feeding | | |

Table 2 (continued)

| <i>Disease</i> | <i>Cause</i> | <i>Per cent mentioned Cause</i> | |
|-----------------------------------|----------------------------------------------------|---------------------------------|------|
| | | D | E |
| | baby seeing dead dog or cat | 6.0 | 1.9 |
| | Don't know | 23.5 | 29.3 |
| Dysentery | Heat or excessive heat | 76.0 | 77.7 |
| | Hot foods | 8.9 | 4.3 |
| | Don't know | 12.9 | 16.8 |
| Worms | Eating uncooked rice | 40.6 | 30.7 |
| | Eating sweet things | 18.2 | 15.3 |
| | Eating earth | 8.1 | 5.0 |
| | Not taking purgative | 7.5 | 5.4 |
| | Dirt in stomach | 5.4 | 4.4 |
| | Bad food | 6.7 | 6.2 |
| | Don't know | 24.8 | 39.1 |
| <i>Sevappu</i> (in baby) | Pregnant woman eating forbidden food | 18.8 | 22.3 |
| | Hereditary | 8.9 | 3.7 |
| | Infectious | 7.5 | 4.3 |
| | Don't know | 56.0 | 63.9 |
| <i>Janni</i> ¹ | a) Sexual intercourse during menstruation | 25.3 | 19.4 |
| | b) Excessive cold | 22.6 | 19.4 |
| | b) Drinking cold water or cold bath after delivery | 18.4 | 22.0 |
| | b) Cold food | 4.7 | 2.0 |
| | Don't know | 28.7 | 43.4 |
| <i>Isivujanni</i> | Cold and cold food | 11.0 | 17.7 |
| | High fever | 1.2 | 3.5 |
| | Weakness of nerves | 3.0 | 3.6 |
| | Don't know | 70.5 | 85.0 |
| Whooping cough | Infection | 31.5 | 17.7 |
| | Ammal (Goddess) | 9.8 | 1.8 |
| | Heat | 5.6 | 15.1 |
| | Don't know | 46.2 | 62.4 |
| Scabies | Heat | 48.4 | 52.7 |
| | No daily bath | 15.2 | 6.9 |
| | Infection | 5.9 | 4.5 |
| | Don't know | 22.0 | 30.5 |
| <i>Raththam</i> <i>Illadha</i> | Not eating nutritious | | |

Table 2 (Continued)

| Disease | Cause | Per cent mentioned Cause | |
|--------------|---------------------------------------------------------|--------------------------|------|
| | | D | E |
| | food | 17.9 | 12.1 |
| | Not eating enough food | 10.1 | 14.4 |
| | Body weakness | 8.1 | 5.1 |
| | Don't know | 52.0 | 65.2 |
| Udhukamalai | Eating uncooked rice and earth when young or eating ash | 47.0 | 44.4 |
| | Bad blood | 5.2 | 3.4 |
| | Don't know | 40.6 | 44.2 |
| | | | |
| Mouth sore | Eating sweet things | 45.6 | 34.0 |
| | Excessive heat | 33.7 | 30.7 |
| | Wound in stomach (ulcer) | 10.0 | 11.3 |
| | Don't know | 13.5 | 21.5 |
| Tuberculosis | Infection | 6.5 | 3.1 |
| | Weakness | 3.9 | 0.2 |
| | Hereditary | 3.2 | 1.1 |
| | Don't know | 70.0 | 87.4 |
| Leprosy | Infection | 31.1 | 8.0 |
| | Hereditary | 10.1 | 5.0 |
| | Excessive sexual intercourse | 4.9 | 3.4 |
| | Sins | 2.7 | 1.6 |
| | Don't know | 69.0 | 80.3 |
| Small pox | Not asked | | |
| | (universally believed to be due to Goddess Mariamma) | | |

1. Two diseases with different causes = (a) and (b)

Table 3
Prevention

| Disease | Prevention | Per cent mentioned prevention | | | | |
|---------|------------------------|-------------------------------|------|------|------|------|
| | | A | B | C | D | E |
| Typhoid | Immunisation | 17.7 | 13.5 | 5.1 | 2.9 | 7.3 |
| | Clean surroundings | 2.3 | 0.7 | 3.2 | 2.1 | 1.6 |
| | No prevention | 5.0 | 2.8 | — | 44.0 | 24.1 |
| | Don't know | 67.3 | 75.9 | 88.0 | 47.2 | 63.8 |
| Cholera | Immunisation/injection | — | — | — | 26.6 | 30.3 |
| | Clean surroundings | — | — | — | 6.0 | 6.2 |
| | Don't know | — | — | — | 23.6 | 46.0 |

Table 3 (continued)

| <i>Disease</i> | <i>Prevention</i> | <i>Per cent mentioned prevention</i> | | | | |
|---------------------------|---------------------------------------|--------------------------------------|------|------|------|------|
| | | A | B | C | D | E |
| Measles | Immunisation | 19.5 | 17.3 | 9.7 | 7.0 | 6.1 |
| | No prevention | 27.7 | 22.7 | 14.4 | 58.8 | 25.4 |
| | Don't know | 37.7 | 54.6 | 71.3 | 33.4 | 66.9 |
| <i>Diarrhoea :</i> | | | | | | |
| <i>Bedhi</i> | Good and clean food | — | — | — | 4.1 | 4.8 |
| | No prevention | — | — | — | 60.2 | 34.8 |
| | Don't know | — | — | — | 34.7 | 58.7 |
| <i>Mandhai</i> | Avoid forbidden food | — | — | — | 13.8 | 12.1 |
| | No prevention | — | — | — | 54.2 | 33.3 |
| | Don't know | — | — | — | 30.6 | 53.7 |
| <i>Dhosam</i> | Avoid seeing aborted women | — | — | — | 3.6 | 1.5 |
| | Mandhrams or 'thayittu' | — | — | — | 3.2 | 5.0 |
| | No prevention | — | — | — | 57.2 | 26.3 |
| | Don't know | — | — | — | 36.0 | 65.5 |
| Dysentery | Eat cold food | — | — | — | 4.2 | 6.5 |
| | Avoid hot food | — | — | — | 2.2 | — |
| | No prevention | — | — | — | 60.0 | 33.9 |
| | Don't know | — | — | — | 33.5 | 58.9 |
| Worms | Frequent purgative | — | — | — | 8.1 | 5.5 |
| | Avoid eating uncooked rice | — | — | — | 4.8 | 2.7 |
| | No prevention | — | — | — | 51.8 | 32.7 |
| | Don't know | — | — | — | 33.0 | 57.5 |
| <i>Janni</i> ¹ | Avoid intercourse during menstruation | — | — | — | 3.2 | 2.5 |
| | Avoid cold water and cold food | — | — | — | 4.8 | 0.4 |
| | Immunisation | — | — | — | 0.6 | 0.3 |
| | No prevention | — | — | — | 51.9 | 30.5 |
| | Don't know | — | — | — | 39.2 | 64.5 |
| <i>Isivujanni</i> | Avoid intercourse during menstruation | — | 0.7 | 0.9 | 0.8 | 0.1 |
| | Immunisation | 7.7 | — | 2.3 | 0.6 | 0.7 |
| | No prevention | 5.9 | 2.1 | — | 50.8 | 16.4 |
| | Don't know | 80.5 | 95.0 | 94.4 | 47.0 | 82.1 |
| Whooping cough | Immunisation/injections | 50.9 | 37.6 | 26.9 | 4.0 | 14.8 |
| | Write name on drumstick tree | 2.3 | 2.8 | 5.6 | 2.4 | 1.0 |

Table 3 (continued)

| Disease | Prevention | Per cent mentioned prevention | | | | |
|-----------------------------|------------------------------------|-------------------------------|------|------|------|------|
| | | A | B | C | D | E |
| | No prevention | 7.3 | 7.1 | 2.3 | 51.0 | 29.6 |
| | Don't know | 31.8 | 45.4 | 49.1 | 36.5 | 62.6 |
| <i>Raththam illadha</i> | Taking good food, fruit or milk | 48.2 | 26.2 | 36.6 | 15.6 | 15.0 |
| | No prevention | 4.5 | 0.7 | 0.9 | 46.5 | 24.1 |
| | Don't know | 38.2 | 66.0 | 49.1 | 35.4 | 36.8 |
| | | | | | | |
| <i>Udhukamalai</i> | Good medical care | — | — | — | 1.9 | — |
| | Avoid uncooked rice, ash | — | — | — | 1.6 | 0.3 |
| | No prevention | — | — | — | 47.0 | 20.4 |
| | Don't know | — | — | — | 49.0 | 78.9 |
| Scabies | Daily bath with soap | — | — | — | 7.3 | 4.4 |
| | No prevention | — | — | — | 51.0 | 29.6 |
| | Don't know | — | — | — | 38.9 | 62.6 |
| Mouth sore | Avoid sweet things | — | — | — | 2.7 | 0.5 |
| | Eat cold food often | — | — | — | 1.9 | 0.5 |
| | Avoid hot food | — | — | — | 1.0 | 0.2 |
| | No prevention | — | — | — | 50.5 | 28.4 |
| | Don't know | — | — | — | 36.0 | 53.5 |
| Tuberculosis | Injection | 9.1 | 5.6 | 4.6 | 1.2 | 0.1 |
| | Nutritious food | 5.0 | 2.1 | 1.9 | 1.0 | 0.2 |
| | No prevention | 14.1 | 9.9 | 1.9 | 50.8 | 15.5 |
| | Don't know | 66.8 | 73.0 | 89.8 | 48.4 | 83.3 |
| Leprosy | Isolation | — | — | — | 0.8 | 0.3 |
| | No prevention | — | — | — | 50.2 | 31.9 |
| | Don't know | — | — | — | 48.4 | 67.1 |
| Small pox | Vaccination/Injection | — | — | — | 6.4 | 8.1 |
| | No prevention | — | — | — | 65.0 | 24.3 |
| | Don't know | — | — | — | 28.9 | 67.8 |

Table 4 (a)

| <i>What is preventive injection ?</i> | <i>Per cent of respondents</i> | | | | |
|------------------------------------------------------|--------------------------------|------|------|------|------|
| | A | B | C | D | E |
| Injection to prevent disease | 63.2 | 47.5 | 46.0 | 30.5 | 44.2 |
| Don't know | 17.7 | 37.6 | 39.8 | 66.0 | 54.6 |
| Injection for children | 13.2 | 11.3 | 11.6 | — | — |
| <i>Does it prevent the disease before it comes ?</i> | | | | | |
| Yes | 67.3 | 52.5 | 48.1 | 29.0 | 42.7 |
| No | 6.8 | 0.7 | 2.3 | 1.3 | 0.4 |
| Don't know | 26.4 | 46.8 | 49.5 | 2.7 | 2.7 |
| Not applicable | — | — | — | 66.0 | 53.9 |

Table 4 (b)

| <i>What diseases can be prevented by preventive injection ?</i> | <i>Per cent of respondents</i> | | | | |
|-----------------------------------------------------------------|--------------------------------|------|------|------|------|
| | A | B | C | D | E |
| <i>ammai</i> (Smallpox etc) | — | — | — | 18.2 | 18.9 |
| Whooping cough | 40.9 | 28.4 | 24.1 | 6.2 | 22.3 |
| Cholera | — | — | — | 17.7 | 20.2 |
| Fever | 11.4 | 9.9 | 2.8 | 4.6 | 5.7 |
| Typhoid | — | — | — | 3.6 | 2.7 |
| Fits, tetanus | 8.2 | 2.1 | 2.3 | 3.3 | 5.6 |
| Tuberculosis | 9.1 | 7.1 | 5.1 | — | — |
| Don't know | — | — | — | 3.0 | 2.6 |
| No applicable | — | — | — | 68.7 | 54.6 |

Table 4 (c)

| <i>Have your children had any preventive injections ?</i> | <i>Per cent of respondents</i> | | | | |
|-----------------------------------------------------------|--------------------------------|------|------|------|------|
| | A | B | C | D | E |
| Yes | 50.5 | 27.7 | 24.1 | 21.0 | 31.4 |
| No | 23.6 | 38.3 | 36.1 | 72.0 | 66.2 |
| Don't know | 10.9 | 23.4 | 13.0 | 4.9 | 2.8 |
| Not applicable | 15.0 | 10.6 | 26.9 | 1.3 | 0.4 |
| <i>For which disease ?</i> | | | | | |
| <i>ammai</i> (small pox) | 12.7 | 4.3 | 4.6 | 14.9 | 14.8 |
| Whooping cough | 27.3 | 12.8 | 10.2 | 5.1 | 14.4 |
| Cholera | — | — | — | 3.2 | 4.9 |
| Fits | — | — | — | 1.4 | 0.3 |
| Typhoid | — | — | — | 1.1 | 0.7 |
| Fever | — | — | — | 0.8 | 1.2 |
| Tuberculosis | — | — | — | 0.5 | 0.5 |
| Don't know | — | — | — | 1.6 | 5.3 |
| Not applicable | — | — | — | 78.2 | 66.6 |

Table 5
Reported Occurrence of Diseases

| Disease | Per cent had it in family | | | | |
|-------------------------|---------------------------|------|------|------|------|
| | A | B | C | D | E |
| Fever | — | — | — | 77.5 | 88.1 |
| Typhoid | — | — | — | 17.7 | 20.1 |
| Cholera | — | — | — | 12.8 | 6.9 |
| Measles | — | — | — | 63.0 | 64.3 |
| Diarrhoea : | | | | | |
| <i>Bedhi</i> | — | — | — | 54.4 | 60.8 |
| <i>Mandhai</i> | — | — | — | 53.0 | 58.9 |
| <i>Dhosham</i> | — | — | — | 59.8 | 65.4 |
| Dysentery | — | — | — | 52.0 | 61.7 |
| Worms | — | — | — | 35.0 | 34.9 |
| <i>Sevappu</i> | — | — | — | 27.5 | 26.1 |
| <i>Janni</i> | — | — | — | 16.7 | 11.9 |
| <i>Isivujanni</i> | — | — | — | 9.3 | 8.7 |
| Whooping cough | 16.4 | 24.8 | 21.3 | 43.4 | 35.6 |
| <i>Raththam illadha</i> | 4.5 | 9.9 | 4.2 | 21.1 | 17.8 |
| Scabies | — | — | — | 41.4 | 37.0 |
| <i>Udhukamalai</i> | — | — | — | 13.6 | 12.1 |
| Mouth sore | — | — | — | 63.0 | 64.5 |
| Tuberculosis | — | — | — | 8.2 | 5.4 |
| Leprosy | — | — | — | 4.6 | 3.4 |

Table 6
Per cent of Attitude Score

| Area | PHC | Allopathic medicine | Immuni- sation | Tuber- culosis treat- ment | Leprosy treat- ment | Latrine |
|------|------|------------------------|-------------------|-------------------------------------|---------------------------|---------|
| A | 30.3 | 40.6 | 58.7 | 18.5 | 0.2 | 8.9 |
| B | 14.8 | 31.2 | 27.6 | 2.8 | -12.9 | -13.0 |
| C | 17.7 | 26.4 | 31.8 | 11.9 | 5.3 | -23.4 |
| D | 16.5 | 15.6 | 18.6 | -7.3 | -0.3 | -16.7 |
| E | 28.6 | 33.3 | 49.5 | 15.6 | 20.0 | -20.4 |

Table 7
Have you ever used any method to prevent pregnancy?

| | % respondents | | | | |
|-----------------------|---------------|------|------|------|------|
| | A | B | C | D | E |
| Yes | 20.5 | 17.0 | 13.4 | 8.5 | 10.6 |
| No | 78.6 | 78.0 | 84.3 | 91.5 | 86.5 |
| No reply | 0.9 | 5.0 | 2.3 | — | — |
| Vasectomy | 8.2 | 7.8 | 6.0 | 4.2 | 4.6 |
| Tubectomy | 8.2 | 5.7 | 3.2 | 1.9 | 4.0 |
| Actual % of acceptors | 21.2 | 19.5 | 12.1 | — | — |

Table 8

| Cause of death | % total deaths | | | |
|--------------------|----------------|------|-----|-----------|
| | | | | |
| | A | B | C | |
| | | | | D E |
| Fewer | | | | 18.2 18.7 |
| Dhosham | | | | 16.3 20.4 |
| Sevappu | | | | 9.9 11.3 |
| Diarrhoea | | | | 8.5 10.0 |
| ammai | 0.9 | 15.0 | 7.7 | 9.5 10.1 |
| Avil Spirits | | | | 5.7 2.9 |
| Mandhai | | | | 4.6 1.8 |
| Accident | | | | 2.3 1.8 |
| Fits | | | | 1.7 3.8 |
| Don't know | | | | 13.4 12.3 |
| Age at death | | | | |
| 1 month | | | | 25.0 25.8 |
| 1—3 months | | | | 8.9 10.5 |
| 4—11 months | | | | 19.7 16.1 |
| 1—5 years | | | | 28.4 33.9 |
| 6—10 years | | | | 7.3 5.1 |
| 11 years and above | | | | 10.7 8.5 |

Table 9
% Attitude score

| Total area | Family Planning | Antenatal care |
|------------|-----------------|----------------|
| A | 17.2 | 61.4 |
| B | 0.9 | 37.8 |
| C | 3.9 | 30.1 |
| D | -24.3 | -16.2 |
| E | -9.8 | -2.1 |

Table 10

| Mean amounts per day | % respondents | | | | |
|----------------------|---------------|------|-----|------|------|
| | A | B | C | D | E |
| Calories 1 year | 233 | 233 | 192 | 429 | 144 |
| 5 years | — | — | — | 975 | 813 |
| Gm protein* | 9.3 | 12.8 | 6.2 | 18.7 | 16.5 |
| Gm greens | 11.5 | 9.5 | 7.1 | 16.6 | 16.4 |
| Gm Jagerry | 5.8 | 3.0 | 1.3 | 1.9 | 3.3 |

* From milk, dal, groundnuts. Does not include protein from rice, kali and kulu

Table 11
% Attitude Score

| Total area | Diet and weaning |
|------------|------------------|
| A | -21.3 |
| B | -48.2 |
| C | -66.9 |
| D | -31.0 |
| E | -45.3 |

Table 12
% Attitude Score

| Village and area | Diet and weaning |
|-----------------------------|------------------|
| <i>Service A:</i> | |
| Edayanchat | 22.1 |
| Thuthipet Panchayat | -3.7 |
| Pennathur | -30.1 |
| Kattuputhur | -49.1 |
| Allivaram | -74.3 |
| <i>Service B:</i> | |
| Soudalipuram ¹ | -47.5 |
| Veppampet | -48.0 |
| Chinnapalambakkam | -49.6 |
| <i>Control area:</i> | |
| Kannadipalayam ² | -62.5 |
| Kesavapuram ² | -62.5 |
| Mettupalayam ² | -55.8 |
| Addukkambarai | -77.1 |
| Sathupalayam | -72.2 |
| Nelvoy | -44.0 |
| Sholavaram | -79.4 |

1. Pennathur Panchayat

2. Pennathur Panchayat, non-service area

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